

REMARKS

Claims 1-4 are pending.

Claim 1 is an independent claim.

Drawings

The indication that the drawings filed were accepted is noted.

Foreign Priority

The indication of the foreign priority documents under 35 U.S.C. § 119 have been received is noted.

Information Disclosure Statement

The indication of the Information Disclosure Statement has been received and the document noted on the Information Disclosure Statement has been considered is noted.

Amendment to Claim 1

A minor editorial change has been made to claim 1 to provide a clear antecedent basis for the feeding device.

Reply to Rejection

Claims 1-4 rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent 5-132173. This rejection is traversed.

For the convenience of the Examiner, a machine translation of this document is enclosed.

With respect to the rejection of base claim 1, the Examiner first asserted that the feeding device 101 is rotatably disposed at the flank of a main apparatus, and that the feeding device is located within an image forming apparatus. While it is correct that the feeding device is within the apparatus as showing in drawing 4, this is not at the flank of the main apparatus. The feeding device cannot be at both places as asserted in the Office Action. Also, as claimed in claim 1, the receptacle 254 and the feeding device are arranged at the flank of the main apparatus. See the description of this feature in the specification as shown in the drawing and as claimed in claim 1. Also, the Examiner stated the urging mechanism includes a projected portion and a hollowed portion that defines the range of play. But the Examiner did not identify where this is in the reference. Also, claim 1 requires the following:

the feeding device is rotatably shifted between an operating position in which sheet feeding action is made and a retracted position in which the device is retracted at the flank of the main apparatus while a predetermined waiting position is disposed between the operating position and the retracted position, and the feeding device is urged by the urging mechanism, at least when set at the operating position and the waiting position and is freed from the urging of the urging mechanism when placed between the waiting position and the retracted position

The above claim feature has not been identified in the rejection. It is incumbent upon the Examiner to identify where each and every limitation of the claim is found in the reference, when a rejection under 35 U.S.C. § 102 is applied. See *Ex parte Levy* 17 USPQ2d 1461, 1462 (BPAI 1990) [cited in the MPEP] wherein the Board stated that follows:

The factual determination of anticipation requires the disclosure in a single reference of every element of the claimed invention....Moreover, it is incumbent upon the examiner to identify wherein each and every facet of the claimed invention is disclosed in the applied reference. (emphasis added)

Even if it were a possibility or probability that the reference showed what is claimed, which it does not, a rejection based on possibilities or probabilities is improper in a rejection under 35 U.S.C. § 102. See, for example, *Continental Can Co. USA, Inc. v. Monsanto*, 20 USPQ 2d, 1746, 1749, 1750 (Fed. Cir. 1991) wherein the Court stated as follows:

To serve as an anticipation when the reference is silent about the asserted inherent characteristic, such gap in the reference may be filled...[such] that the missing... matter is necessarily present in the reference, and that it would be so recognized by persons of ordinary skill... Inherency... may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient...

In summary, the document JP 5-132173 (JP) discloses an ordinary sheet feeder accommodated within an image forming apparatus. Meanwhile, the present application in the context claimed discloses a manual sheet feeder which is disposed at the flank of the image forming apparatus.

With respect to the dependent claims, these claims are consider patentable at least for the same reasons as the base claim.

For the reasons set forth above, the Examiner is requested to reconsider and withdraw the rejection of the claims under 35 U.S.C. § 102.

Non Elected Claims

The non-elected claims have been cancelled. The right to file a divisional application for the non-elected invention is maintained.

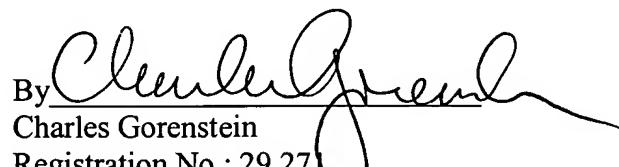
CONCLUSION

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Elliot A. Goldberg (Reg. No. 33,347) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Dated: December 7, 2005

Respectfully submitted,

By 
Charles Gorenstein
Registration No.: 29,271
BIRCH, STEWART, KOLASCH & BIRCH, LLP
8110 Gatehouse Rd
Suite 100 East, P.O. Box 747
Falls Church, Virginia 22040-0747
(703) 205-8000
Attorney for Applicant

Attachment: Machine Translation of Japanese Patent 5-132173

* NOTICES *

JPO and NCIP are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] The feed roller shaft with which the feed roller was attached, and the inversion roller shaft with which it was connected through the above-mentioned feed roller shaft and the gear, and the torque limiter and the inversion roller were attached, While it has the calling-in roller shaft with which it was connected through the above-mentioned feed roller shaft, the gear, and the lever member, and the calling-in roller was attached and the feed direction makes an opposite direction rotate the above-mentioned inversion roller with the rotation actuation to the feed direction of the above-mentioned feed roller shaft In the feed equipment which feeds paper by making it rotate in the feed direction while rotating the above-mentioned lever member and pressing down the above-mentioned calling-in roller in a form The play of the predetermined range is given between the gears attached in the above-mentioned feed roller shaft and this feed roller shaft. Feed equipment characterized by having made the opposite direction rotate the above-mentioned feed roller shaft with the feed direction, without rotating the above-mentioned inversion roller, and moving the above-mentioned calling-in roller to a position in readiness from a feed location after the form back end to which paper is fed passes the above-mentioned calling-in roller.

[Claim 2] Feed equipment according to claim 1 characterized by forming a slot so that the above-mentioned pin may have play in the gear side face attached in this feed roller shaft while drilling a pin hole in the above-mentioned feed roller shaft and fitting in a pin in the range of a position in readiness from the above-mentioned calling-in roller feeding location.

[Translation done.]

* NOTICES *

JPO and NCIP are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.

2. **** shows the word which can not be translated.

3. In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the feed equipment which carries out sequential feeding of the form laid on the form installation plate with a calling-in roller and a feed roller.

[0002]

[Description of the Prior Art] For example, the feed equipment of the conventional copying machine was constituted by the feed roller 5 attached in the feed roller shaft 1, the calling-in roller 7 attached in the calling-in roller shaft 17, and the inversion roller 10 attached in the inversion roller shaft 12 as shown in drawing 5 R> 5 and drawing 6.

[0003] If the sheet paper cassette in which the form was laid is set to the body of a copying machine, a form will be pushed up upwards by the Oshiage member 18.

[0004] And based on a copy start signal, the feed roller shaft 1 rotates in the feed direction. Moreover, while the calling-in roller 7 connected with the feed roller shaft 1 by gears 3, 4, and 5 rotates in the feed direction, the calling-in roller lever 9 rotates in a feed location, and paper is fed to the 1st form.

[0005] At the time of feed actuation, although it rotates to an opposite direction, since the frictional resistance between the feed roller 5 and the inversion roller 10 is larger than resistance between this inversion roller 10 and a torque limiter 11, the feed direction is taken to the feed roller 5, and the inversion roller shaft 12 connected by the feed roller shaft 1 and gears 14, 15, and 16 carries out it the surroundings.

[0006] It was fixed in the condition that the feed roller shaft 7, a gear 14 and the inversion roller shaft 12, and a gear 16 do not have play. Therefore, when it reached between the feed roller 5 and the inversion roller 10, paper was fed to the 1st form with which it was fed with the calling-in roller 7 into equipment with the two above-mentioned rollers.

[0007] Moreover, since the inversion roller 10 is reversed due to coefficient of friction when two or more sheets of forms overlap and it is sent in, the form after the 2nd sheet is returned to a sheet paper cassette side.

[0008] In the condition [having carried out the pressure welding to the form], since the calling-in roller 7 is being interlocked with the feed roller 5, after the form back end of the 1st sheet passes the calling-in roller 7, it will send in the 2nd form and will cause a double feed.

[0009] So, in conventional feed equipment, the calling-in roller 7 was moved to the feed location and the position in readiness to the timing set up beforehand.

[0010] After feeding of a form of the 1st sheet, rotation of the feed roller shaft 1 is stopped, with the calling-in roller raising spring 20, the calling-in roller lever 9 was rotated up by having used the feed roller 5 as the supporting point, and, specifically, the calling-in roller 7 was moved to the position in readiness.

[0011]

[Problem(s) to be Solved by the Invention] However, the inversion roller shaft connected by rotation of a calling-in roller lever by the feed roller shaft and the gear in the above-mentioned conventional feed

equipment rotated in the feed direction, the torque limiter locked the inversion roller shaft, the inversion lock rotated in the feed direction, and when two or more sheets of forms were sent in, there was a fault of carrying out a double feed.

[0012]

[Means for Solving the Problem] The feed roller shaft with which it was made in order that this invention might solve the above-mentioned conventional fault, and the feed roller was attached, The inversion roller shaft with which it was connected through the above-mentioned feed roller shaft and the gear, and the torque limiter and the inversion roller were attached, While it has the calling-in roller shaft with which it was connected through the above-mentioned feed roller shaft, the gear, and the lever member, and the calling-in roller was attached and the feed direction makes an opposite direction rotate the above-mentioned inversion roller with the rotation actuation to the feed direction of the above-mentioned feed roller shaft In the feed equipment which feeds paper by making it rotate in the feed direction while rotating the above-mentioned lever member and pressing down the above-mentioned calling-in roller in a form The play of the predetermined range is given between the gears attached in the above-mentioned feed roller shaft and this feed roller shaft. After the form back end to which paper is fed passes the above-mentioned calling-in roller, it is characterized by having made the opposite direction rotate the above-mentioned feed roller shaft with the feed direction, without rotating the above-mentioned inversion roller, and moving the above-mentioned calling-in roller to a position in readiness from a feed location.

[0013]

[Function] Since according to the feed equipment of this invention it can prevent that an inversion roller rotates in the feed direction when moving a calling-in roller to a position in readiness, reliable feeding which prevented the feed mistake of a double feed etc. can be performed.

[0014]

[Example] Hereafter, one example of this invention is explained with reference to a drawing.

[0015] Drawing 1 is the perspective view showing the outline configuration of the feed equipment concerning this invention.

[0016] Drawing 2 is the outline block diagram showing the condition under feeding of the feed equipment concerning this invention.

[0017] Drawing 3 is the outline block diagram showing the waiting condition of the feed equipment concerning this invention.

[0018] Drawing 4 is the appearance perspective view of the copying machine equipped with the feed equipment concerning this invention.

[0019] In drawing, 1 is a feed roller shaft and the slip spring 2, a file plate 3, the calling-in roller lever 9, the gear 4, the feed roller 5, and the calling-in roller lever 9 are attached in this feed roller shaft 1 one by one.

[0020] Moreover, the gear 13 is attached in the edge of the opposite side in the calling-in roller lever 9 of the feed roller shaft 1.

[0021] 12 is an inversion roller shaft and the gear 16, the torque limiter 11, and the inversion roller 10 are attached one by one.

[0022] The gear 16 attached in the inversion roller shaft 12 is connected through the gear 13 attached in the feed lock shaft 1, and the gear 15.

[0023] 17 is a calling-in roller shaft and the calling-in roller lever 9-9 with which the end was attached in the feed roller shaft 1, the gear 8, and the calling-in roller 7 are attached.

[0024] The gear 8 attached in the calling-in roller shaft 17 is connected through the gear 4 attached in the feed roller shaft 1, and the gear 6.

[0025] Moreover, between body frames, the calling-in roller pull-up spring 20 is laid the calling-in roller 7 side of the calling-in roller lever 9, and it is energized in the position-in-readiness direction where the calling-in roller 7 separated from the form with this calling-in roller pull-up spring 20.

[0026] It is being fixed by gears 4, 8, and 16 so that there may be no play to a shaft, respectively, but only the gear 13 is attached so that the play of the predetermined range may arise to the feed roller shaft

1.

[0027] As concrete means of attachment, a pin hole is opened in gear 13 attaching position of the feed roller shaft 1, and it fits in so that both ends may project a parallel pin 14 in this pin hole.

[0028] Moreover, slot 13a of the shape of a rectangle which is extent in which a parallel pin 14 is settled is formed in one lateral portion of a gear 13. The width method of this slot 13a is set as the dimension which a gear 13 does not rotate even if the feed roller shaft 1 rotates in the include angle theta (about 3 degrees - 5 degrees) rotated from a feed location to a position in readiness by using the feed roller shaft 1 as the supporting point, the dimension 7, i.e., above-mentioned calling-in roller, which had allowances to the dimension of a parallel pin 14.

[0029] A parallel pin 14 is located on the pair square wire of slot 13a in a calling-in roller feeding location, and when 3 degrees of calling-in rollers 7 rotate to a position in readiness, for example, specifically, it sets up so that a parallel pin 14 may be located on another diagonal line and may stop.

[0030] The feed equipment constituted as mentioned above is formed in each feed section. Next, feed actuation is explained.

[0031] First, if the sheet paper cassette which laid the form of the size to wish is set to a body, the form installation plate 21 will go up to the calling-in location beforehand set up by the Oshiage member 18. Next, if copy conditions etc. are set up and a copy start key is pushed, based on a copy start signal, the feed roller shaft 1 will rotate in the feed direction, and the feed roller 5 will rotate in this direction.

[0032] At this time, similarly the calling-in roller shaft 17 connected through the gear 4 and gears 6 and 8 which are attached in the feed roller shaft 1 rotates in the feed direction, and the calling-in roller 7 currently fixed to this shaft 17 in connection with it also rotates in this direction.

[0033] Moreover, since the inversion roller shaft 12 and the inversion roller 10 which are connected through the gear 13 attached in the feed roller shaft 1, the gear 15, and the gear 16 are located under the form to which paper is fed, they rotate the feed direction to an opposite direction.

[0034] However, in the condition that a form does not exist between the feed roller 5 and the inversion roller 10, since the frictional resistance between the feed rollers 5 and the inversion rollers 10 in a contact condition is larger than the frictional resistance between the inversion roller shaft 12 and a torque limiter 11, the inversion roller 10 is taken to the feed roller 5, is carried out the surroundings, and rotates in the feed direction.

[0035] To rotation actuation and coincidence of the above-mentioned roller, the calling-in roller lever 9 uses the feed roller shaft 1 as the supporting point, it rotates to a feed location, and the calling-in roller 7 is pressed down by the top (the 1st sheet) form on the form installation plate 21.

[0036] Since the calling-in roller lever 9 is suppressed by the file plate 3 with the slip spring 2, it rotates to a feed location with rotation of the feed roller shaft 1, but since resistance between this calling-in roller 7 and a form exceeds after the calling-in roller 7 is pressed down by the 1st form, the calling-in roller lever 9 slips.

[0037] Therefore, the force in which the calling-in roller 7 presses down a form is kept constant.

[0038] Next, since the inversion roller 10 contacts the feed roller 5, is taken in the feed direction and carried out the surroundings with the spring 19 with ** when the 1st form is sent out with the calling-in roller 7 and reaches between the feed roller 5 and the inversion roller 10, it is sent in the feed direction as it is.

[0039] Since the frictional resistance between the inversion roller 10 and the feed roller 5 becomes weaker and the direction of the frictional resistance between the inversion roller shaft 12 and a torque limiter 11 exceeds when it has been sent between the feed roller 5 and the inversion roller 10 at this time, with two or more sheets of forms overlapped, the feed direction is rotated to hard flow on the turning effort transmitted through gears 13, 15, and 16 from the feed roller shaft 1.

[0040] Therefore, the form after the 2nd sheet is returned to a sheet paper cassette side.

[0041] If the feed roller shaft 1 is rotated in the direction contrary to the feed direction after the 1st form passes the calling-in roller 7, 3 degrees of calling-in roller levers 9 will rotate from a feed location to a position in readiness, for example, and the calling-in roller 7 will be separated from a form.

[0042] Since play is between the feed roller shaft 1 and a gear 13 at this time, a gear 13 is not rotated

until the calling-in roller 7 reaches a position in readiness.

[0043] Therefore, since a torque limiter 11 does not lock the inversion roller shaft 12, the inversion roller 10 cannot be rotated in the feed direction, but, as a result, can prevent the double feed of a form.

[0044]

[Effect of the Invention] Since according to the feed equipment of this invention it can prevent that an inversion roller rotates in the feed direction when moving a calling-in roller to a position in readiness, reliable feeding which prevented the feed mistake of a double feed etc. can be performed.

[Translation done.]

*** NOTICES ***

JPO and NCIP are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

TECHNICAL FIELD

[Industrial Application] This invention relates to the feed equipment which carries out sequential feeding of the form laid on the form installation plate with a calling-in roller and a feed roller.

[Translation done.]

* NOTICES *

JPO and NCIP are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.

2. **** shows the word which can not be translated.

3. In the drawings, any words are not translated.

PRIOR ART

[Description of the Prior Art] For example, the feed equipment of the conventional copying machine was constituted by the feed roller 5 attached in the feed roller shaft 1, the calling-in roller 7 attached in the calling-in roller shaft 17, and the inversion roller 10 attached in the inversion roller shaft 12 as shown in drawing 5 R> 5 and drawing 6.

[0003] If the sheet paper cassette in which the form was laid is set to the body of a copying machine, a form will be pushed up upwards by the Oshiage member 18.

[0004] And based on a copy start signal, the feed roller shaft 1 rotates in the feed direction. Moreover, while the calling-in roller 7 connected with the feed roller shaft 1 by gears 3, 4, and 5 rotates in the feed direction, the calling-in roller lever 9 rotates in a feed location, and paper is fed to the 1st form.

[0005] At the time of feed actuation, although it rotates to an opposite direction, since the frictional resistance between the feed roller 5 and the inversion roller 10 is larger than resistance between this inversion roller 10 and a torque limiter 11, the feed direction is taken to the feed roller 5, and the inversion roller shaft 12 connected by the feed roller shaft 1 and gears 14, 15, and 16 carries out it the surroundings.

[0006] It was fixed in the condition that the feed roller shaft 7, a gear 14 and the inversion roller shaft 12, and a gear 16 do not have play. Therefore, when it reached between the feed roller 5 and the inversion roller 10, paper was fed to the 1st form with which it was fed with the calling-in roller 7 into equipment with the two above-mentioned rollers.

[0007] Moreover, since the inversion roller 10 is reversed due to coefficient of friction when two or more sheets of forms overlap and it is sent in, the form after the 2nd sheet is returned to a sheet paper cassette side.

[0008] In the condition [having carried out the pressure welding to the form], since the calling-in roller 7 is being interlocked with the feed roller 5, after the form back end of the 1st sheet passes the calling-in roller 7, it will send in the 2nd form and will cause a double feed.

[0009] So, in conventional feed equipment, the calling-in roller 7 was moved to the feed location and the position in readiness to the timing set up beforehand.

[0010] After feeding of a form of the 1st sheet, rotation of the feed roller shaft 1 is stopped, with the calling-in roller raising spring 20, the calling-in roller lever 9 was rotated up by having used the feed roller 5 as the supporting point, and, specifically, the calling-in roller 7 was moved to the position in readiness.

[Translation done.]

*** NOTICES ***

JPO and NCIPPI are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

EFFECT OF THE INVENTION

[Effect of the Invention] Since according to the feed equipment of this invention it can prevent that an inversion roller rotates in the feed direction when moving a calling-in roller to a position in readiness, reliable feeding which prevented the feed mistake of a double feed etc. can be performed.

[Translation done.]

*** NOTICES ***

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, the inversion roller shaft connected by rotation of a calling-in roller lever by the feed roller shaft and the gear in the above-mentioned conventional feed equipment rotated in the feed direction, the torque limiter locked the inversion roller shaft, the inversion lock rotated in the feed direction, and when two or more sheets of forms were sent in, there was a fault of carrying out a double feed.

[Translation done.]

*** NOTICES ***

**JPO and NCIP are not responsible for any
damages caused by the use of this translation.**

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

MEANS

[Means for Solving the Problem] The feed roller shaft with which it was made in order that this invention might solve the above-mentioned conventional fault, and the feed roller was attached, The inversion roller shaft with which it was connected through the above-mentioned feed roller shaft and the gear, and the torque limiter and the inversion roller were attached, While it has the calling-in roller shaft with which it was connected through the above-mentioned feed roller shaft, the gear, and the lever member, and the calling-in roller was attached and the feed direction makes an opposite direction rotate the above-mentioned inversion roller with the rotation actuation to the feed direction of the above-mentioned feed roller shaft In the feed equipment which feeds paper by making it rotate in the feed direction while rotating the above-mentioned lever member and pressing down the above-mentioned calling-in roller in a form The play of the predetermined range is given between the gears attached in the above-mentioned feed roller shaft and this feed roller shaft. After the form back end to which paper is fed passes the above-mentioned calling-in roller, it is characterized by having made the opposite direction rotate the above-mentioned feed roller shaft with the feed direction, without rotating the above-mentioned inversion roller, and moving the above-mentioned calling-in roller to a position in readiness from a feed location.

[Translation done.]

*** NOTICES ***

**JPO and NCIP are not responsible for any
damages caused by the use of this translation.**

1. This document has been translated by computer. So the translation may not reflect the original precisely.

2. **** shows the word which can not be translated.

3. In the drawings, any words are not translated.

OPERATION

[Function] Since according to the feed equipment of this invention it can prevent that an inversion roller rotates in the feed direction when moving a calling-in roller to a position in readiness, reliable feeding which prevented the feed mistake of a double feed etc. can be performed.

[Translation done.]

*** NOTICES ***

JPO and NCIPI are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

EXAMPLE

[Example] Hereafter, one example of this invention is explained with reference to a drawing.

[0015] Drawing 1 is the perspective view showing the outline configuration of the feed equipment concerning this invention.

[0016] Drawing 2 is the outline block diagram showing the condition under feeding of the feed equipment concerning this invention.

[0017] Drawing 3 is the outline block diagram showing the waiting condition of the feed equipment concerning this invention.

[0018] Drawing 4 is the appearance perspective view of the copying machine equipped with the feed equipment concerning this invention.

[0019] In drawing, 1 is a feed roller shaft and the slip spring 2, a file plate 3, the calling-in roller lever 9, the gear 4, the feed roller 5, and the calling-in roller lever 9 are attached in this feed roller shaft 1 one by one.

[0020] Moreover, the gear 13 is attached in the edge of the opposite side in the calling-in roller lever 9 of the feed roller shaft 1.

[0021] 12 is an inversion roller shaft and the gear 16, the torque limiter 11, and the inversion roller 10 are attached one by one.

[0022] The gear 16 attached in the inversion roller shaft 12 is connected through the gear 13 attached in the feed lock shaft 1, and the gear 15.

[0023] 17 is a calling-in roller shaft and the calling-in roller lever 9-9 with which the end was attached in the feed roller shaft 1, the gear 8, and the calling-in roller 7 are attached.

[0024] The gear 8 attached in the calling-in roller shaft 17 is connected through the gear 4 attached in the feed roller shaft 1, and the gear 6.

[0025] Moreover, between body frames, the calling-in roller pull-up spring 20 is laid the calling-in roller 7 side of the calling-in roller lever 9, and it is energized in the position-in-readiness direction where the calling-in roller 7 separated from the form with this calling-in roller pull-up spring 20.

[0026] It is being fixed by gears 4, 8, and 16 so that there may be no play to a shaft, respectively, but only the gear 13 is attached so that the play of the predetermined range may arise to the feed roller shaft 1.

[0027] As concrete means of attachment, a pin hole is opened in gear 13 attaching position of the feed roller shaft 1, and it fits in so that both ends may project a parallel pin 14 in this pin hole.

[0028] Moreover, slot 13a of the shape of a rectangle which is extent in which a parallel pin 14 is settled is formed in one lateral portion of a gear 13. The width method of this slot 13a is set as the dimension which a gear 13 does not rotate even if the feed roller shaft 1 rotates in the include angle theta (about 3 degrees - 5 degrees) rotated from a feed location to a position in readiness by using the feed roller shaft 1 as the supporting point, the dimension 7, i.e., above-mentioned calling-in roller, which had allowances to the dimension of a parallel pin 14.

[0029] A parallel pin 14 is located on the pair square wire of slot 13a in a calling-in roller feeding location, and when 3 degrees of calling-in rollers 7 rotate to a position in readiness, for example,

specifically, it sets up so that a parallel pin 14 may be located on another diagonal line and may stop. [0030] The feed equipment constituted as mentioned above is formed in each feed section. Next, feed actuation is explained.

[0031] First, if the sheet paper cassette which laid the form of the size to wish is set to a body, the form installation plate 21 will go up to the calling-in location beforehand set up by the Oshiage member 18. Next, if copy conditions etc. are set up and a copy start key is pushed, based on a copy start signal, the feed roller shaft 1 will rotate in the feed direction, and the feed roller 5 will rotate in this direction.

[0032] At this time, similarly the calling-in roller shaft 17 connected through the gear 4 and gears 6 and 8 which are attached in the feed roller shaft 1 rotates in the feed direction, and the calling-in roller 7 currently fixed to this shaft 17 in connection with it also rotates in this direction.

[0033] Moreover, since the inversion roller shaft 12 and the inversion roller 10 which are connected through the gear 13 attached in the feed roller shaft 1, the gear 15, and the gear 16 are located under the form to which paper is fed, they rotate the feed direction to an opposite direction.

[0034] However, in the condition that a form does not exist between the feed roller 5 and the inversion roller 10, since the frictional resistance between the feed rollers 5 and the inversion rollers 10 in a contact condition is larger than the frictional resistance between the inversion roller shaft 12 and a torque limiter 11, the inversion roller 10 is taken to the feed roller 5, is carried out the surroundings, and rotates in the feed direction.

[0035] To rotation actuation and coincidence of the above-mentioned roller, the calling-in roller lever 9 uses the feed roller shaft 1 as the supporting point, it rotates to a feed location, and the calling-in roller 7 is pressed down by the top (the 1st sheet) form on the form installation plate 21.

[0036] Since the calling-in roller lever 9 is suppressed by the file plate 3 with the slip spring 2, it rotates to a feed location with rotation of the feed roller shaft 1, but since resistance between this calling-in roller 7 and a form exceeds after the calling-in roller 7 is pressed down by the 1st form, the calling-in roller lever 9 slips.

[0037] Therefore, the force in which the calling-in roller 7 presses down a form is kept constant.

[0038] Next, since the inversion roller 10 contacts the feed roller 5, is taken in the feed direction and carried out the surroundings with the spring 19 with ** when the 1st form is sent out with the calling-in roller 7 and reaches between the feed roller 5 and the inversion roller 10, it is sent in the feed direction as it is.

[0039] Since the frictional resistance between the inversion roller 10 and the feed roller 5 becomes weaker and the direction of the frictional resistance between the inversion roller shaft 12 and a torque limiter 11 exceeds when it has been sent between the feed roller 5 and the inversion roller 10 at this time, with two or more sheets of forms overlapped, the feed direction is rotated to hard flow on the turning effort transmitted through gears 13, 15, and 16 from the feed roller shaft 1.

[0040] Therefore, the form after the 2nd sheet is returned to a sheet paper cassette side.

[0041] If the feed roller shaft 1 is rotated in the direction contrary to the feed direction after the 1st form passes the calling-in roller 7, 3 degrees of calling-in roller levers 9 will rotate from a feed location to a position in readiness, for example, and the calling-in roller 7 will be separated from a form.

[0042] Since play is between the feed roller shaft 1 and a gear 13 at this time, a gear 13 is not rotated until the calling-in roller 7 reaches a position in readiness.

[0043] Therefore, since a torque limiter 11 does not lock the inversion roller shaft 12, the inversion roller 10 cannot be rotated in the feed direction, but, as a result, can prevent the double feed of a form.

[Translation done.]

* NOTICES *

JPO and NCIP are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the perspective view showing the outline configuration of the feed equipment concerning this invention.

[Drawing 2] It is the outline block diagram showing the condition under feeding of the feed equipment concerning this invention.

[Drawing 3] It is the outline block diagram showing the waiting condition of the feed equipment concerning this invention.

[Drawing 4] It is the appearance perspective view of the copying machine equipped with the feed equipment concerning this invention.

[Drawing 5] It is the perspective view showing the outline configuration of conventional feed equipment.

[Drawing 6] It is the important section sectional view of conventional feed equipment.

[Description of Notations]

1 Feed Roller Shaft

5 Feed Roller

7 Calling-in Roller

9 Lever Member

10 Inversion Roller

11 Torque Limiter

12 Inversion Roller Shaft

13 Gear

13a Slot

14 Pin

17 Calling-in Roller Shaft

[Translation done.]

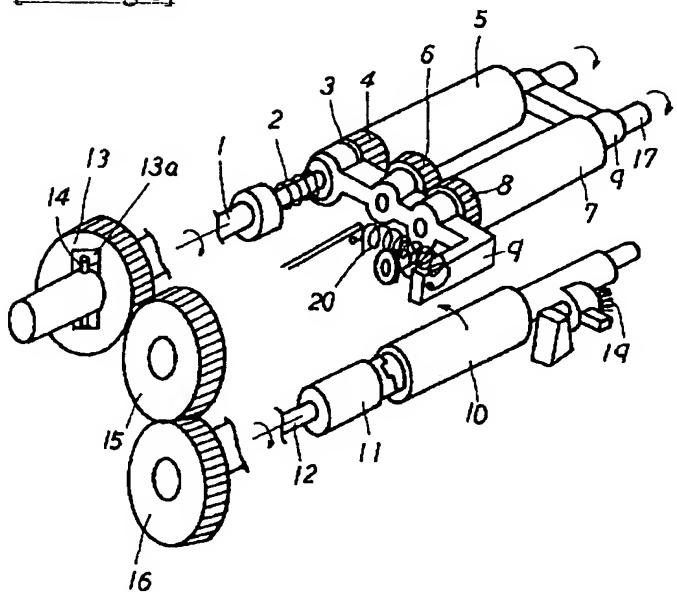
* NOTICES *

JPO and NCIPI are not responsible for any damages caused by the use of this translation.

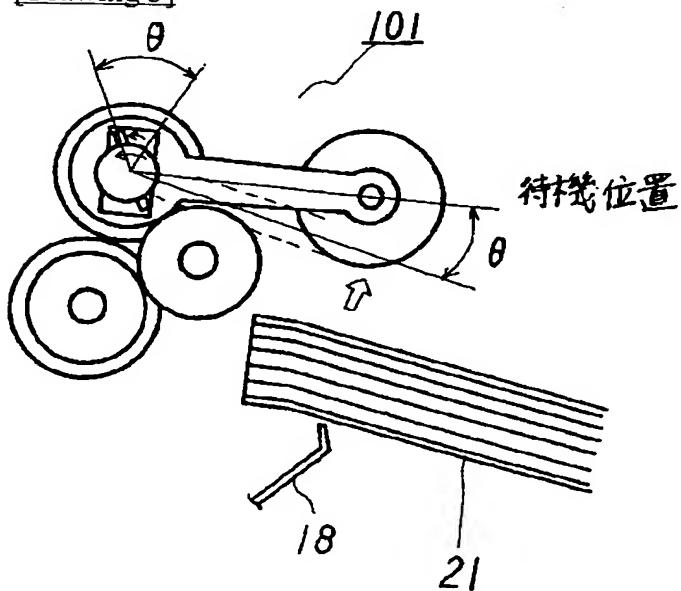
1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DRAWINGS

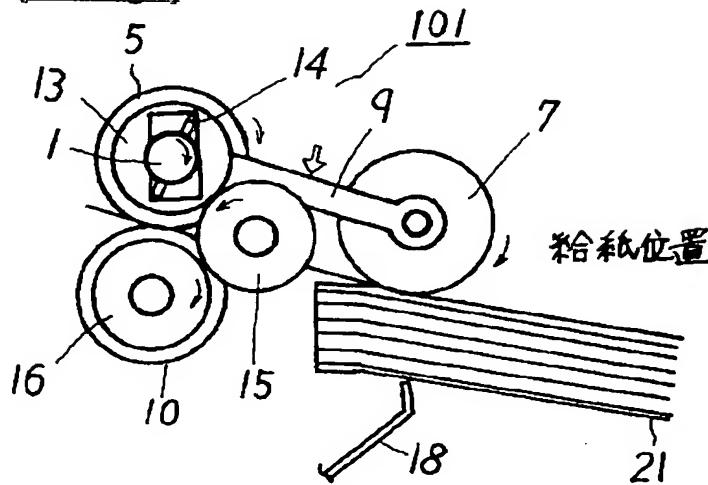
[Drawing 1]



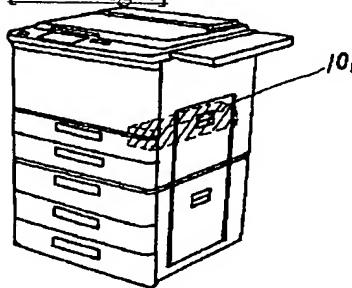
[Drawing 3]



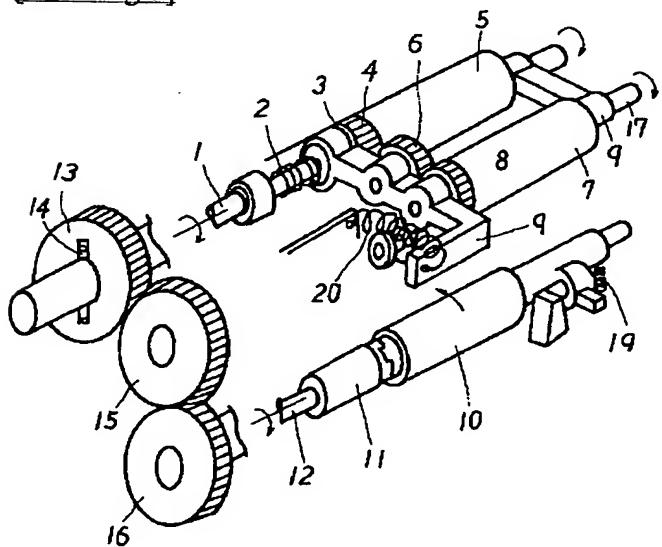
[Drawing 2]



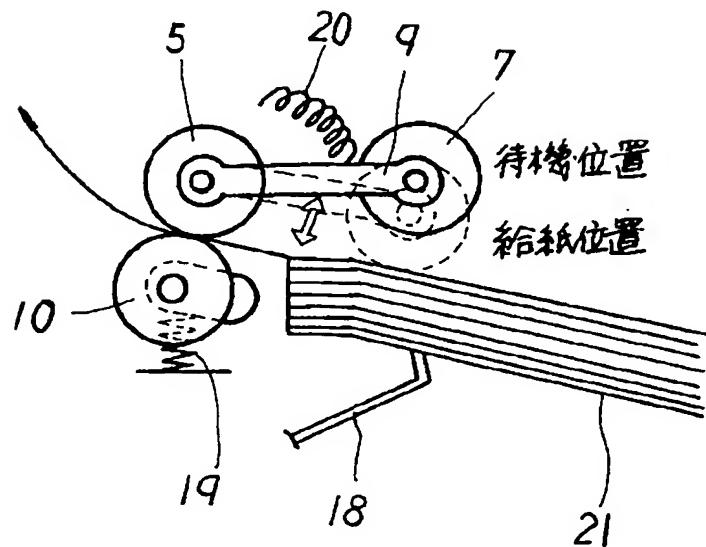
[Drawing 4]



[Drawing 5]



[Drawing 6]



[Translation done.]